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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/511,312

10/15/2004

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EXAMINER

YEH, EUENG NAN

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/511,312

Applicant(s)

TANABE ET AL.

Examiner

Eueng-nan Yeh

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date Oct 30, 2006; Oct 15, 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

The drawings are objected to because of following minor informalities:

- Figure 7 the last box of "IMAGE DATA READ UNIT" needs to be corrected as REAR#n.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention, "Image processing device and image processing method" is too general to reveal the real intention to which the claims are directed. A new title is suggested: "An image processing system with parallel input and restart marker".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gatto et al. (US 6,344,906 B1) and Smith et al. (US 5,848,192).

Regarding claims 1, Gatto discloses an image processing system comprising:
an image memory to store a plurality of image data (as depicted in figure 8, numeral 49
"Memory Control Unit 49 controls the access to external or internal volatile memory
devices and to non-volatile memory devices ... External memory is used to store data
and to retrieve data such as configuration data, calibration data, look-up tables and
working data. The Memory Control Unit 49 is capable of performing FIFO (First-In First-

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Out) data access. An example of such volatile external memory is shown at reference numeral 910 and 1010 in FIG. 9 and FIG. 10, respectively" at column 9, line 28)
read in parallel (as depicted in figure 5 "FIG. 5 shows a typical duplex document scanner. In FIG. 5, a document 27 is displaced by two rotating rollers 22 and 24 driven by a motor 25 over two fixed linear sensors 26 and 23 that sense reflected light from each of the two sides of the document ...The linear sensors, together with their associated electronics, record a line of information for each side of the document. When the document is driven by the motor and the rollers, the linear sensors, together with their associated electronics, record the entire document area swept on both sides. The scanner control electronics and the communication link with the host computer are not shown in FIG. 5" at column 7, line 7. Thus, the data, i.e. the entire document area as one page, are read in parallel);

image compression unit to carry out compression processing on the plurality of image data read out by the image read unit (as depicted in figure 8, numeral 52 image compression unit "Image Compression Unit 52 performs, at the input pixel rate, document image compression using public algorithms ... The Image Compression Unit 52 is capable of performing image compression algorithms such as G3, G4, G5, TIFF, JPEG ..." at column 17, line 34. As known in the art of image processing that JPEG data are processed in unit of blocks);

image read unit to read out the plurality of image data from the image memory in block units (as depicted in figure 8, numeral 49 "Memory Control Unit 49 controls the access to external or internal volatile memory devices and to non-volatile memory devices ...

External memory is used to store data and to retrieve data such as configuration data, calibration data, look-up tables and working data ... An example of such volatile external memory is shown at reference numeral 910 and 1010 in FIG. 9 and FIG. 10, respectively" at column 9, line 29. Thus, the memory control unit can be considered as an image read unit to read out image data from image memory in unit of block for JPEG format processing);

Gatto discloses an image processing system to read a page of data in parallel and compressed to JPEG format. Gatto does not explicitly disclose that the system can read predetermined number of blocks of data and insert an identifier or marker after the final block.

Smith, in the same field of endeavor of data processing ("a method and apparatus for compression of digital data" at column 1, line 11), teaches the width, i.e. left and right, detection for the N/S hardware to do the JPEG processing "[t]he top and bottom borders are detected by the JPEG processing/compression path hardware, but the right (leading) edge and left (trailing) edge are detected upstream by the N/S hardware ... The N/S hardware will only qualify data in groups of 8 vertical scans. In other words, the N/S hardware frames the image in the horizontal dimension on block boundaries. Therefore, the only action the JPEG processing/compression hardware need perform to detect the width of the image (in block units) is to count every eighth qualified scan from the N/S unit. By doing this, the JPEG processing/compression hardware is able to furnish the horizontal dimension of the image to the DSP as soon as the image is input from the N/S" at Smith column 11, line 56. Thus, the width of the

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image or horizontal row of blocks is determined by N/S hardware for JPEG processing. And then switch to next row to repeat the width detection. See also "After compressing each horizontal row of blocks, the Post Processor will insert the two-byte restart marker and the number of padding bytes required to align restart markers on 32-bit boundaries ..." at Smith column 13, line 46.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to enhance the image processing system Gatto made with predetermined number of blocks and the insertion of restart marker as taught by Smith, in order to have a more robust processing system.

Regarding claim 2, Gatto and Smith combination discloses:

the image read unit reads out each of the plurality of image data prior to storing all of the data for each of the plurality of image data in the image memory (as depicted in Gatto figure 9, the image read unit, numeral 49 figure 8, as a part of the Universal Document Scanner Controller #902 which controls the scanner #900 "duplex scanner 900 using the Universal Document Scanner Controller 902 according to the present invention ... in the case of a Duplex scanner, the amplifiers 904 and 906 receive the analog outputs from the sensors 913 and 914 located on each side of the document to be scanned ..." at Gatto column 10, line 47. Thus, the image read unit reads data prior to storing in the memory);

image compression unit performs image compression in the block units on the plurality of image data read out from the image read unit (discussed in claim 1, data with the size of the width of the image or horizontal row of blocks are used for JPEG processing).

Regarding claim 3, the predetermined number can be changed, and the designation of the order of switching of the plurality of image data can be changed (discussed in claim 1 for the Smith's width detection "...the right (leading) edge and left (trailing) edge are detected upstream by the N/S hardware ... The N/S hardware will only qualify data in groups of 8 vertical scans. In other words, the N/S hardware frames the image in the horizontal dimension on block boundaries ..." at Smith column 11, line 57. Therefore, the predetermined number of blocks can be changed, and then the switching to the next designated blocks of data can be changed too).

Regarding claim 4, the image compression is JPEG compression, and the identifier is a restart marker (discussed in claim 1, this is JPEG compression, and the inserted identifier is a restart marker).

Regarding claim 5, the plurality of image data is one page of image data, and the predetermined number is a number corresponding to the width in the main scanning direction of each page for the plurality of image data (discussed in claim 1, this duplex document scanner scans one page of data and the predetermined number is the width of scanned image data).

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gatto et al. and Smith et al. as applied to claims 1-5 discussed above, and further in view of Yokose et al. (US 6,549,663 B1).

Regarding claim 6, the combination of Gatto and Smith teaches:
image processing control unit to receive an image file storing image-compressed image data (as depicted in Gatto figure 8, numeral 60 is the image processing control unit to receive an image file storing image-compressed image data before output to a printer or a display);
image expansion unit to expand the image-compressed image data (as depicted in Gatto figure 8, numeral 60 is the image expansion unit to expand the image-compressed image data before output to a printer or a display);
image-compressed image data comprises a plurality of image data read in parallel, and each of the plurality of image data includes predetermined numbers of blocks of a predetermined size which are image-compressed in units of the blocks and an identifier inserted after the last block of the predetermined numbers of blocks, and the plurality of image data is arranged so as to switch over between the plurality of image data according to a designated order (discussed in claim 1 for the image processing system);

The Gatto and Smith combination does not explicitly teach the markers separation and blocks expansion.

Yokose, in the same field of endeavor of image processing ("overwriting image data at low cost and high speed" at column 1, line 10), teaches markers separation and JPEG blocks expansion to form individual image as depicted in figure 9(b) "In FIG. 9(b), RST (ReSTart) is a marker, or a control signal of JPEG that initializes the bit position of code data and the difference value of direct current components. By connecting the code data of each small area by RST, it is possible to decode separately generated code data as one image data" at column 11, line 33. Thus, the marker separation separates code data into different groups and then the expansion will decode group of JPEG blocks to form image.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to provide the image processing system of Gatto and Smith combination, markers separation and JPEG blocks expansion as taught by Yokose, in order to have the compressed data properly printed or displayed.

Regarding claim 7, the combination of Gatto, Smith, and Yokose teaches:
storing a plurality of image data read in parallel (discussed in claim 1, an image memory to store a plurality of image data read in parallel);
reading out the plurality of image data read in parallel by repeatedly reading a predetermined number of predetermined blocks for each of the plurality of image data and switching the plurality of image data according to a designated order after the reading (discussed in claim 1, image reading unit reading predetermined number of blocks and the switching);

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inserting an identifier after the final block of the predetermined number of blocks after image compression the predetermined number of blocks for each of the plurality of image data by image compression in block units the plurality of image data read out (discussed in claim 1, the restart marker insertion);

receiving an image file storing the image-compressed image data (discussed in claim 6, image processing control unit);

separating the image-compressed image data each of the plurality of image data according to the identifiers included in the image-compressed image data (discussed in claim 6, separation process);

expanding each of the separated plurality of data in units of the blocks (discussed in claim 6, expansion process).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Mui et al (US 6,362,870 B2): duplex scan head having dual scan capability to scan both sides of a page of an original document during a single pass of the page.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eueng-nan Yeh whose telephone number is 571-270-1586. The examiner can normally be reached on Monday-Friday 8AM-4:30PM EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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